DOCUMENT RESUME

ED 357 655 FL 021 311

AUTHOR Miner, Kenneth L.
TITLE On Some Theoretical Implications of Winnebago Phonology.
PUB DATE 93
NOTE 21p.; For the serial issue in which this paper appears, see FL 021 304.
PUB TYPE Information Analyses (070) -- Journal Articles (080)
JOURNAL CIT Kansas Working Papers in Linguistics; v18 p111-130 1993

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *American Indian Languages; *Linguistic Theory; *Phonology; *Structural Analysis (Linguistics); *Syllables; Uncommonly Taught Languages; Vowels
IDENTIFIERS *Winnebago; Winnebago (Tribe)

ABSTRACT

This paper is essentially a commentary on Steriade 1990, which deals with certain aspects of Winnebago phonology. The issues cluster around a much-discussed process known as Dorsey's Law (see Miner 1992 and references given there) that is operative in Mississippi Valley Siouan and that Steriade has generalized to other language groups. Winnebago syllable structure, cyclic syllabification, cluster reduction, and the formalization of Dorsey's Law itself are discussed. (Contains 10 references.) (Author/JL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
S. Manuel
Dupont
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ED357655

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ON SOME THEORETICAL IMPLICATIONS OF WINNEBAGO PHONOLOGY

Kenneth L. Miner
University of Kansas

Abstract: This paper is essentially a commentary on Steriade 1990, which deals *i.a.* with certain aspects of Winnebago phonology. The issues cluster around a much-discussed process known as Dorsey's Law (see Miner 1992 and references given there) which is operative in Mississippi Valley Siouan and which Steriade has generalized to other language groups. I discuss Winnebago syllable structure, cyclic syllabification, cluster reduction and the formalization of Dorsey's Law itself.

Introduction.

Dorsey's Law (hereafter DL) in Winnebago is a process which copies a vowel into an immediately preceding cluster of voiceless obstruent + resonant:

$$\begin{bmatrix}-son\\-vce\end{bmatrix}\ \begin{bmatrix}-syl\\+son\end{bmatrix}\ [+syl\ ]$$

$$1 \quad 2 \quad 3 \quad \rightarrow \quad 1\ 3\ 2\ 3$$

(Below we will consider non-GP formalizations of DL). Thus *pra* → *para*, *kna* → *kana* and so on. Such words as the following show the effect of DL (copied vowels are underlined; "-" separates person prefix from root/stem):

(1)	*šoróš*	'deep' */šroš/*
	karahé	'be on the way returning' */krahe/*
	šawapóx	'you stab' */š-wapox/*
	hiperés	'know' */hipres/*
	hirupini	'twist' */hirupni/*
	kerepána	'unit of ten' */krepna/*
	šuruxúruk	'you earn' */š-ruxruk/*

In Miner 1981 I pointed out that DL must be prevented from applying in VC][CV contexts, as in the underlying form of *wáagnáka* 'that man sitting' ([*waak*] 'man' + [*nak*] 'sitting' + *-ga* 'that'; note that we do not get **waakanaka*) while being allowed to apply within single morphemes, e.g., [*hiruknana*] 'boss' →

Kansas Working Papers in Linguistics, Volume 18, 1993, pp. 111-130

hirukánana.[1] When a voiceless obstruent precedes a resonant which belongs to a following root in a compound, or to a suffix, as in *wáagnáka*, instead of triggering DL it voices, and a brief schwa intervenes between the obstruent and the resonant.

I also mentioned in Miner 1981 that we cannot simply constrain the rule so as to apply only within single morphemes because in the case of either of two prefixes, each consisting of a single voiceless obstruent, DL does apply rather than the voicing of the obstruent and the insertion of schwa. The first of these DL-triggering prefixes is the second person prefix for second-conjugation verbs, *š-*. Compare the following second conjugation verbs in their citation form and with the prefix:

(2) stems not beginning with a resonant

gúu 'leave returning here'
šgúu (2nd p)
t'ée 'die'
šǰée (2nd p)
'íi 'live, be alive'
š'íi (2nd p)

(3) stems beginning with a resonant (copied vowel underlined)

waší 'dance'
šawaší (2nd p)
rugás 'tear'
šurugás (2nd p)
rée 'go'
šeré (2nd p)

The other prefix that behaves this way is *k-* 'one's own', also when attached to second conjugation verbs beginning with a resonant:

(4) stems not beginning with a resonant

'úu 'make; wear'
k'úu 'make, wear one's own'
hi'é 'find'
hik'é 'find one's own'

(5) stems beginning with a resonant (copied vowel underlined)

rušip 'pull down'
kurušip 'pull down one's own'
račgą́ 'drink'
karačgą́ 'drink one's own'

Steriade 1990 suggests that the correct application of Dorsey's Law can be obtained if syllabification in Winnebago is cyclic (1990:389) and if the syllabification rule ignores morphemes consisting of a single consonant on the first cycle (1990:fn 8). One purpose of this paper is to check this hypothesis against further data.

Steriade notes that the suggested analysis assumes that the obstruent-resonant clusters which are broken up by DL are complex syllable onsets, and inserts the cautionary remark (1990:390) that "this may not be completely clear in Winnebago." A second purpose of this paper is to make it clear that this assumption of Steriade's is correct.

Finally, Steriade suggests that DL is most straightforwardly formulated in a theory without timing slots, such as the gestural model of Browman & Goldstein. Some further evidence from Winnebago is given in support of this conclusion.

Winnebago Syllable Structure.

Segments.

Assuming without argument that those Winnebago obstruents (both stops and fricatives) that are immediately followed by a glottal stricture consist of two segments rather than single segments specified with some feature for glottality,[2] the underlying consonants of Winnebago are as follows:

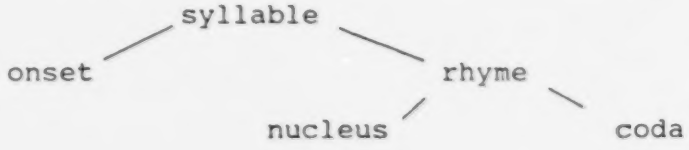
(6)

	labial	dental	palatal	velar	glottal
stops					
voiceless	*p*	*t*	*č*	*k*	
voiced	*b*		*ǰ*	*g*	
fricatives					
voiceless		*s*	*š*	*x*	
voiced		*z*	*ž*	*ǧ*	
nasals		*m*	*n*		
trill			*r*		
glides	*w*		*y*		*h*

Note that obstruents occur in pairs of voiceless/voiced except for *t*. This single dental stop, although written *t* traditionally following Susman 1943 and Lipkind 1945 is in fact voiced except in the cluster *st*, on which see below.

Another traditional graph, *ǧ*, denotes a voiced velar fricative.

I assume the Winnebago syllable has the familiar structure



and in the following sections I will give the phonotactics of the various syllable constituents. What I am describing here is the root syllable; it will be seen below that suffixes mostly conform to the conditions on root-initial onsets; however prefixes have reduced phonology and, except for the *š-* and *k-* prefixes mentioned above, are not relevant to DL nd will not be discussed in this paper.

Onsets.

A syllable onset consists minimally of a single consonant; it may contain two consonants, or one consonant plus a vocoid functioning as a glide or

transition element. This vocoid (any vowel but a) will be discussed below when I deal with vowels in §3.

Single-consonant onsets may contain any consonant. Therefore the onset node must license all of the distinctive features (autosegments) for underlying Winnebago consonants.

(7)

In two-consonant onsets the first member is always a voiceless obstruent. On the basis of the second member these two-consonant onsets divide naturally into (a) those in which the second member is the glottal stop, (b) those in which the second member is an obstruent, and (c) those in which the second member is a resonant. Only (c) undergo Dorsey's Law.

Any of the voiceless obstruents in the first onset position can be followed by the glottal stop except, rather inexplicably, *č*:

(8)

p'aap'áč 'give to the touch'
t'úup 'put something long'
k'ée 'dig'
s'íi 'for a long time'
š'ée 'drip'
x'ée 'drip' (thin liquids)

An obstruent second member of a two-consonant onset is systematically a voiced plosive or a voiceless spirant--that class of [αcontinuant, -αvoiced] obstruents shown in Miner 1979 to recur often in Siouan phonotactics--except that the [+grave] pair *b/x* is omitted. The following are the possibilities:

(9)

	g	ǰ	s	š
p		*pǰ	ps	pš
k		kǰ	ks	kš
s	sg	*sǰ		
š	šg	šǰ		
x	xg	xǰ		
č	čg		*čs	*čš

Though not central to our discussion, a few points regarding these clusters may be made. All of the empty intersections are accounted for by noting that obstruents of same manner of articulation do not occur (no two stops, no two spirants, no two affricates[3]); that is, a syllable onset licenses only one set of manner of articulation features. Apparently the frequent claim that onsets license only one place feature is counter-exemplified in Winnebago by *šǰ*. It may be significant that all the clusters except *šǰ* have a grave (labial or velar) component. This same *šǰ* cluster is also the only exception to the generalization that only one member of a two-consonant onset may be [+strident], which would account for **čs, *čš*. However for the moment I treat the asterisked possibilities as ad hoc. In addition to the above at least partly principled clusters, *st* occurs with voiceless *t*, in violation of the [αcontinuant, -αvoiced] constraint on second member. It is theoretically possible to treat *st* as derived in every instance from the missing **sǰ* (for reasons see below), which would leave only **pǰ* as wholly anomalous.

The following examples exemplify the possible two-consonant onsets of this type:

(10)
psįįpsíč 'small change'
pšoopšóč 'fine'
ksáač 'stiff'
kšée 'apple'
kǰée 'revenge'
stoohí 'gather'
sgáa 'white'
šgáač 'play'
šǰáak 'warm'
xgąąsák 'energetic'
xǰaanáne 'yesterday'
-čga 'try'

In the case of two-consonant onsets with resonant as second member, again the first member is a voiceless obstruent except *t* (*p k s š x č*), while the second member is any of the three resonants *r, n, w* except that **čr* does not occur in native words.

The following exemplify the onsets of this third type:

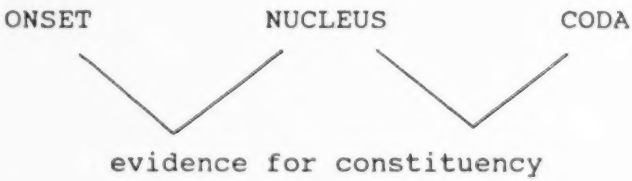
(11)
/pras/ 'flat'
/pna/ 'odor'
/kre/ 'leave returning'
/knu/ 'first son'
/srek/ 'long and thin'
/sni/ 'cold'
/šra/ 'hairless'
/šna/ 'be visible'
/šwu/ 'itch'
/xre/ 'boil'
/xnu/ 'small'
/xwani/ 'lost'
/čwi/ 'sound causing reverberation'

It is clear that while voicing is contrastive in the case of single-consonant onsets (e.g., *čáa* 'deer' vs. *ǰáa* 'frozen'; *síi* 'leg' vs. *zíi* 'yellow/brown'), since any consonant can occur as a single-consonant onset, voicing is not contrastive in the case of two-consonant onsets. In clusters like *šǰ, čg* the use of graphs for voiced plosives in second position comes from Susman 1943, who made the decision on the basis of phonetic similarity: there is no voicing contrast in this position but since the occurring segments are wholly unaspirated while voiceless obstruents before vowels may be aspirated, she identified them with the voiced obstruents. But what we really want to say about these clusters, like the English *sp, st, sk* syllable-initial clusters that have been discussed for so many years, is that voicing is not

contrastive in them.

Note that this is not the same as saying that such a cluster requires only one specification of contrastive voicing for the entire cluster (this point has often been made; see the summary and references in Goldsmith 1990:124-5). The latter claim would be valid for a language allowing such contrasts as *ts ~ dz*, etc. In Winnebago no two clusters contrast in voicing in any position.

This is not the first time a difference has been noted between CV syllables and CCV syllables. The CV syllable type shows that problematic constituency between onset and nucleus that inhibits our commitment to the rhyme:



Thus in Igbo, for example, a predominantly CV language, there are obvious co-occurence restrictions between the C and the V which do not occur in languages with more complex syllable types.

Obstruent-resonant Onsets

As mentioned above, Steriade 1990 was uncertain about whether the obstruent-resonant clusters to which DL applies are syllable onsets. Note however that the examples in (11) above show these clusters occurring utterance-initially in underlying representations, just as (10) shows the non-resonant clusters in utterance-initial position. The only difference between the two types of cluster is that the resonant clusters undergo DL, whether they occur in utterance-initial position or in medial position.

It is very clear that these clusters arise from syllable onsets historically as well; see for example the Chiwere cognates given in Miner 1992.

Codas

A syllable coda may consist of at most one obstruent; all are permitted except *t*; and they are always (underlyingly) voiceless in this position. Thus, like two-consonant onsets (see above), codas do not have contrastive voicing. (I remind the reader here that voicing is nonetheless contrastive in Winnebago, namely,

in single-consonant syllable onsets, e.g., *sii* 'leg' vs. *zii* 'yellow, brown.') Note that since only voiceless consonants occur in codas, while both voiced and voiceless consonants and *t* occur in (single-consonant) onsets, Winnebago conforms to the usual pattern of reduced phonology in codas. Several syllable codas are seen in the examples in (10) & (11).

Vowels, Nuclei and Prominence.

The vowels of Winnebago are as follows:

(12)

i *u*

e *o*

a

i̯ *u̯*

a̯

Examples of the vowels abound in the foregoing. Two vowels (I prefer the term "vocoid" (Pike) to cover both nuclear and non-nuclear -cons segments) frequently, and three infrequently, form clusters. When this happens, the strongest vowel becomes prominent in accordance with the following strength hierarchy, first noted by Susman 1943:

STRONG ← *a o u e i* → WEAK

This prominent vowel becomes the nucleus of the syllable and takes the properties of accent (relatively high pitch sometimes accompanied by extra amplitude) if the syllable is accented. The other vocoids become part of the onset or coda (i.e., become "glides") depending on whether they precede or follow the nuclear vowel. Examples:

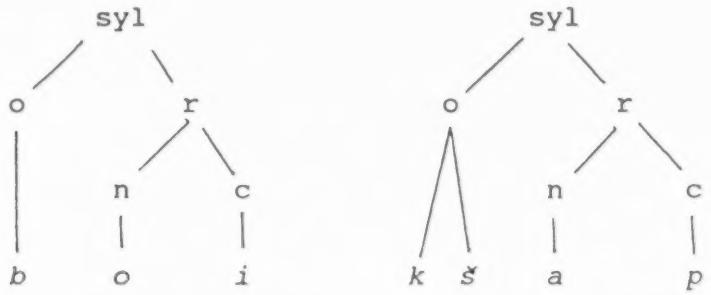
(13)

'áipa 'bracelet'
boáče 'I shoot off a piece'
bóiksap 'I come to'
hoiročá 'straight ahead'
nái̯waču̯gis 'saw' (n)
čiómi̯š 'rug'
hakeweánaga 'six and'
etc.

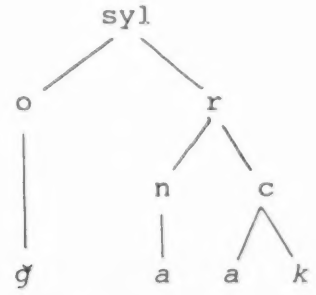
Accented long vowels have a falling pitch contour; thus it appears that their first members are nuclei:

(14) *zii* 'yellow, orange'
sgáa 'white'

The word *bóikšap* 'I come to' given above has the following syllable structure:

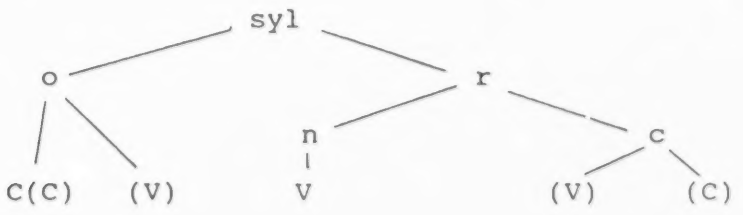


Here the coda of the first syllable is a non-prominent vocoid, while the coda of the second syllable (which has a complex onset) is a voiceless obstruent. The word *ǧáak* 'cry' has the structure:



The occurrence of a syllable-final obstruent would be limited to word-final position (as in the case of *bóikšap*) were it not for compounding. Outside of compounding, any consonant cluster goes with the following vowel in forming syllables (see below).

The syllable structure of the language, then, can be summarized as follows:



Note that this syllable structure implies that if all three vocalic positions are filled, the middle one must be prominent; this seems to be correct, although three-vowel clusters are uncommon. In the following examples, *o* is prominent:

(15) *wioiré* 'west'
čioiǰás 'tent'
nįoisą́ 'faded'

In the following, *ą́* is prominent:

(16) *šįą́įgexǰį* 'I am clumsy'

and so on.

Syllabification

The syllabification rules of Kahn (1976) are applicable to Winnebago:

(17) a. associate the syllable node σ to a vowel;
b. attach consonants one by one to the left as long as the syllable structure conditions in the language are not violated;
c. attach the remaining consonants one by one to the right as long as the syllable structure conditions in the language are not violated.

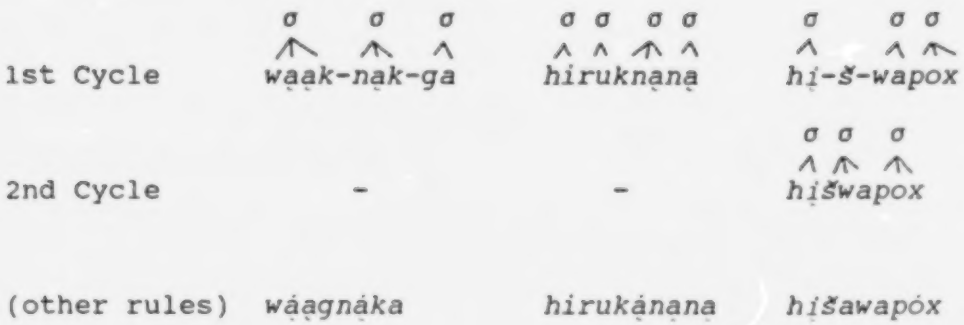
Let us apply this syllabification process to words of each crucial type we have discussed: *wą́ągną́ka* 'that man sitting' */wąąk-nąk-ga/*, *hirukąnąną* 'boss' */hiruknąną/*, *hįšawapóx* 'you stab me' */hį-š-wapox/* (*hį-* 1p obj; *š-* 2p agent; *wapox* 'stab'). First we apply the rules non-cyclically (since syllable structure per se is not relevant to our discussion we omit it for simplicity):

(18) Non-cyclic syllabification

(17a) waak-nak-ga hiruknana hi-š-wapox
(17b) waaknakga hiruknana hišwapox
(17c) - - hišwapox
(other rules) waaknaka hiruknana hišwapox
DL *waakanaka hirukanana hišawapox

Non-cyclic syllabification gives not *waagnaka* but **waakanaka*--there is no way to keep *kn* in this derivation from becoming a syllable onset and undergoing DL. If on the other hand syllabification is cyclic, Steriade notes (1990:389), *k* will become a syllable coda on the first cycle and thus, according to Prince's (1985:479) Free Element Condition, will not be available for the onset of the following syllable. The prefix *š-* on the other hand will not become part of any syllable on the first cycle, since a syllable must have a vowel. This *š* will then be available for the onset of the following syllable on the next cycle:

(19) Cyclic syllabification



Apparently Steriade is right, then, that the assumption of cyclic syllabification (and the Free Element Condition) is required in Winnebago to account for the behavior of intramorphemic as opposed to heteromorphemic obstruent-resonant sequences as well as the assignment of single-morpheme consonants to the following onset. In the following section I will discuss some phenomena which seem to challenge the Free Element Condition.

Cluster Reduction

Consonant clusters of up to three consonants (one in a coda, combined with either one or two in an onset) arise in the compounding of roots, and these clusters remain:

(20)

péeǰwáač	'locomotive'
péeč	'fire'
wáač	'boat'
haapčék	'Monday'
hąąp	'day'
čéek	'new'
háačté	'I go to eat'
háač	'I eat'
tée	'I go'

etc.

Note that clusters like *ǰw, pč, čt* are tolerated under these conditions and that they are not permissible onsets. Steriade's claim of cyclic syllabification plus the FEC accounts for the fact that they do not become onsets.

Suffixes begin with a vowel or a resonant (either of which voices a stem-final obstruent, a brief schwa appearing between the obstruent and the resonant in the case of the resonant); with any single obstruent (*č, ǰ,*

k, g, š, ž, are attested); or, in a few cases, with two obstruents. Interestingly, the two-obstruent clusters found suffix-initially are permitted as root onsets as well: *š', š', šg, kǰ, xǰ.* Generally when these are attached to roots/stems ending in an obstruent the resulting three-consonant cluster is tolerated:

(21)	*guučs'á*		'repeatedly shoot'
		gúuč	'shoot'
		-s'a	'do repeatedly'
	gišipšgúnį		'he must have fallen
		gíšip	'fall'
		-šgunį	(dubitative)
	kanąksgé		'maybe he married'
		kanąk	'marry'
		-sge	(uncertainty)

The toleration of these clusters, like the ones mentioned above which arise in compounding, is presumably due to cyclic syllabification and the FEC.

However a few suffixes appear to challenge the FEC; apparently the clusters to which they give rise do become onsets and the clusters are then made to conform with the requirements of onsets. I will show however that this is a case of a segment filling a vacated syllable position, rather than a violation of the FEC. The suffixes in question all begin with a velar followed by *ǰ* and involve the deletion of the velar.

The endings *-kǰe, -kǰare* (this *r* always becomes a weakly nasalized *n*, written *ñ*), and *-kǰanąhe* (all future or imperfective markers) have these shapes after vowels. After obstruents the combination *C-kǰ* may be broken up by the insertion of *i*: *gišgáp* 'strike'; *gišgabikǰąñé* 'he will strike'. But a more complex change may also occur, whereby *i* is inserted into the last syllable of the stem, the *k* of the suffix elides, and the *ǰ* becomes *t* (voiceless) after *s*, elides itself after *č*, and remains after other obstruents: *gišgáipǰąñé* 'he will strike'; *wiiráperes* 'you (sg) learn' (*hiperés* 'learn' with *wa-* intransitivizer); *wiirápereste* 'you (sg) will learn'; *haginą́č* 'suffer', *haginą́ǰče* 'will suffer.'

As noted there are two possible outcomes in the case of these endings: that represented by *gišgabikǰąñé* (I will call this outcome I) and that represented by *gišgáipǰąñé* (I will call this outcome II).

The ending *-xǰį* (intensifier; 'genuine') after a consonant loses its *x* and the *ǰ* undergoes the same changes just described: *háas* 'berry'; *haastį* 'blueberry'; *péeč* 'fire', *peečí* 'real fire;' *giisǰį* 'very curved.'

Using *-kǰe* (and assuming prior *i*-epenthesis) and *-xǰį* as examples, we have these developments:

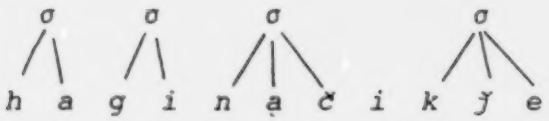
(22) metathesis		velar elision		adaptation to onset		
pikǰe	→	*ipkǰe*	→	*ipǰe*		
čikǰe	→	*ičkǰe*	→	*ičǰe*	→	*iče*
kikǰe	→	*ikkǰe*	→	*ikǰe*		
sikǰe	→	*iskǰe*	→	*isǰe*	→	*iste*
šikǰe	→	*iškǰe*	→	*išǰe*		
xikǰe	→	*ixkǰe*	→	*ixǰe*		
		pxǰi	→	*pǰi*		
		čxǰi	→	*čǰi*	→	*či*
		kxǰi	→	*kǰi*		
		sxǰi	→	*sǰi*	→	*sti*
		šxǰi	→	*šǰi*		
		xxǰi	→	*xǰi*		

Notice that the underlined clusters in the third column (*čǰ* and *sǰ*) are ones that are disallowed as syllable onsets; they become *č* and *st* respectively, which do conform to the onset conditions.

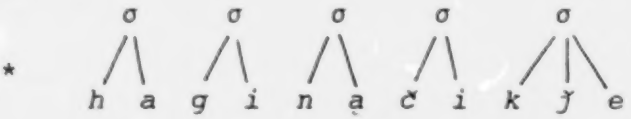
It is interesting that *pǰ* is tolerated here, however, since it has never been found as a root onset--cf. (8) above, recalling that I stated there that "it is theoretically possible to treat *st* as derived in every instance from the missing *sǰ*, which would leave only **pǰ* as wholly anomalous." It is tempting to think that the absence of **pǰ* in (9) might be an accidental gap; however, many years of work with this language by a number of linguists have failed to turn up a single case of root-initial *pǰ*.

The main point of this section is this: since clusters arising in suffixation adapt themselves to onset tactics, they must become onsets. This appears to violate the FEC, since what is syllabified once as a coda--the *s* of *hi.pe.rés* 'learn' for example--ends up as part of an onset--in *hi.pe.re.sté* 'will learn.'

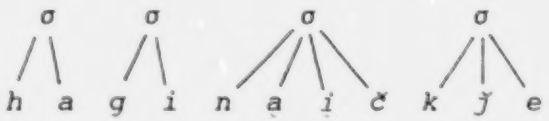
However if we assume cyclic syllabification and also that outcomes I and II for the imperfective endings differ in the relative ordering of *i*-Epenthesis and syllabification, it is fairly easy to see what is happening here. I will deal with the more complex outcome II first. Taking the form *haginąč* 'suffer' as an example, we have, if syllabification applies before *i*-Epenthesis (outcome II), the following after both rules apply:



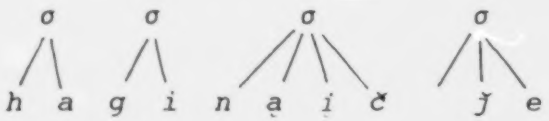
Here syllabification is complete but the epenthetic vowel is not assigned to a syllable. It must be picked up by either the coda of the preceding syllable or the onset of the following. The latter is full, so it can only become part of the coda of the preceding syllable; the FEC prevents *c*, which has already been assigned to a coda, from becoming the onset of a new syllable *či* giving



(wrong for outcome II) and thus the vowel joins the preceding syllable coda by "automatically metathesizing" around the coda consonant, giving



When then the velar *k* deletes, it is an onset slot that is left unfilled:



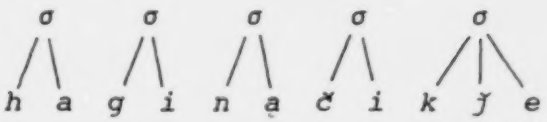
It is natural, considering the well-known principle of maximal onset, that *č* will move to the onset of the following syllable. Since this violates onset conditions, however, this cluster cannot remain and *ǰ* deletes, giving *haginą̄i̯če*. Clusters which are permitted as onsets, however, remain, as seen in (22).

Of course the fact that *ǰ* rather than the original stem-final obstruent deletes or occlusivizes remains unexplained; I have also no way to motivate velar deletion other than to point out that velars are often found to be weak segments.

For outcome I, *i*-Epenthesis applies before syllabification and we get *haginą̄ǰikǰe* with the epenthetic vowel simply forming a syllable with the stem-final obstruent--after *i*-Epenthesis we have:

h a g i n ą č i k ǰ e

Then after syllabification we have:



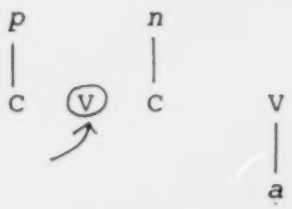
By a later rule a stem-final obstruent voices before a suffix-initial vowel, giving finally *haginą́ǰikǰe*.

Theoretical Implications of Dorsey's Law

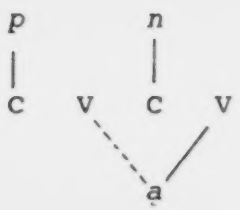
Steriade 1990 argues that DL has implications for a choice between the autosegmental model, which posits timing slots, and a tiered gestural model after Browman & Goldstein (1986, 1990) which does not and in which, therefore, gestures have inherent timing.

DL was formalized in §0 as it might be in a GP framework. In an autosegmental model it would be, as Steriade 1990 notes, formalized as a two-step process: first, a timing slot (say, a V) must be inserted; then this inserted V must be associated with the following vowel:

(23) i.



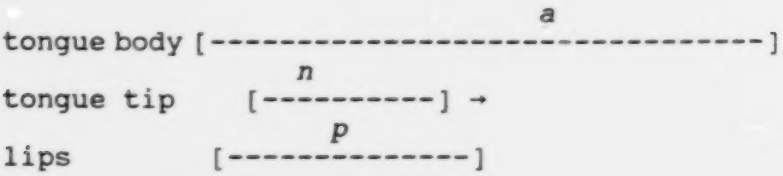
ii.



As Steriade (1990:388) observes, the problem is that "the insertion of a V slot in a string like /i.tra/ creates a new syllable: /i.tV.ra/. At this point, it is no longer possible to determine that the syllable /tV/ was at some point a part of the last syllable /tra/: it is therefore not possible to tell whether the V in /tV/ should associate to the features of the preceding /i/ or of the following /a/."

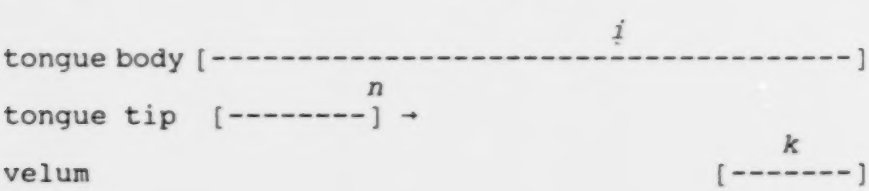
In contrast, in a gestural framework we have to do merely with a delay in the onset of the resonant component (1990:391):

(24) Tiers Gestures



Steriade's argument is somewhat strengthened by another Winnebago process, one which affects the only CVC suffix in the language, diminutive *-nįk*. This suffix optionally and in casual speech shows up as *-įñk*: *čaaší* 'gopher', *čaašinįk* or *čaašíñk* (diminutive); *wakę́* 'raccoon', *wakenįk*, *wakę́įñk* (diminutive); *wanįk* 'bird', *wanįgnįk* or *wanįgiñk*. (This is the only source of *ñ* in Winnebago, and there are no other true palatal consonants, which motivates selection of *-nįk* as the underlying shape.) Since this change occurs whether *-nįk* follows a consonant or a vowel, it does not seem possible to explain it in terms of syllable structure as was done above with the diminutive and imperfective endings. But if gestures have inherent duration this process too is easily seen as a delay in the onset of the resonant component:

(25) Tiers Gestures



Conclusion

I have attempted to support the contentions of Steriade with regard to Winnebago phonology and have brought to bear some fresh data. Combined with the fairly extensive work done on the accentual phenomena of the language, this completes a preliminary theoretical account of the major phonological processes of Winnebago. A comprehensive lexical phonology remains to be worked out.

NOTES

[1] Note that accent must apply both before and after DL. I will have nothing to say about accent in this paper, as details are amply discussed in Miner 1992 and references given there.

[2] Since it does not seem relevant to the issues discussed in this paper, I will not argue this here.

[3] This was noticed by Susman 1943.

REFERENCES

Browman, Catherine P., and Louis Goldstein, 1986. Towards an articulatory phonology. Phonology Yearbook 3.219-252.

Browman, Catherine P., and Louis Goldstein, 1990. Tiers in articulatory phonology, with implications for casual speech. In Kingston & Beckman 1990, pp. 341-376.

Kahn, D., 1976. Syllable-based Generalizations in English Phonology. MIT Ph.D. dissertation.

Kingston, John, and Mary E. Beckman, eds., 1990. Papers in Laboratory Phonology I: Between the Grammar and Physics of Speech. Cambridge: Cambridge University Press.

Miner, Kenneth L., 1979. An unusual natural class in Mississippi Valley Siouan. Siouan and Caddoan Linguistics 2.8,9.

Miner, Kenneth L., 1981. Metrics, or Winnebago made harder. International Journal of American Linguistics 47.340-342.

Miner, Kenneth L., 1992. Winnebago accent: the rest of the data. Anthropological Linguistics 31:3,4.148-172.

Prince, Alan S., 1985. Improving tree theory. Proceedings of the Eleventh Annual Meeting of the Berkeley Linguistics Society pp 471-490.

Steriade, Donca, 1990. Gestures and autosegments: comments on Browman & Goldstein's paper. In Kingston & Beckman 1990 pp. 382-397.

Susman, Amelia, 1943. The Accentual System of Winnebago. Columbia University Ph.D. dissertation.